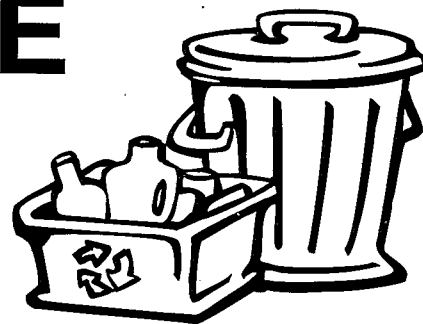




REUSABLE NEWS



Reducing Waste Can Make a World of Difference:

The Link Between Solid Waste and Global Climate Change

Waste reduction has a variety of environmental benefits. It reduces pollution, conserves natural resources, and in many cases saves energy. But reducing waste has another, often overlooked, benefit. It can help stop global climate change, the gradual warming of the Earth caused by increasing amounts of "greenhouse gases" in the atmosphere.

Rising levels of gases in the Earth's atmosphere are causing changes in our climate, and some of these changes can be traced to solid waste. The manufacture, distribution, and use of products—as well as management of the resulting waste—all lead to emissions of atmospheric gases that affect the Earth's climate.

Waste prevention and recycling—jointly referred to as "waste reduction"—help us better manage the solid waste we generate. But preventing waste and recycling also are potent strategies for reducing greenhouse gases (GHGs).

(Continued on page 2)

What Are Greenhouse Gases?

Some greenhouse gases (GHGs) occur naturally in the atmosphere, while others result from human activities. Naturally occurring GHGs include water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Certain human activities, however, add to the levels of most of these naturally occurring gases.

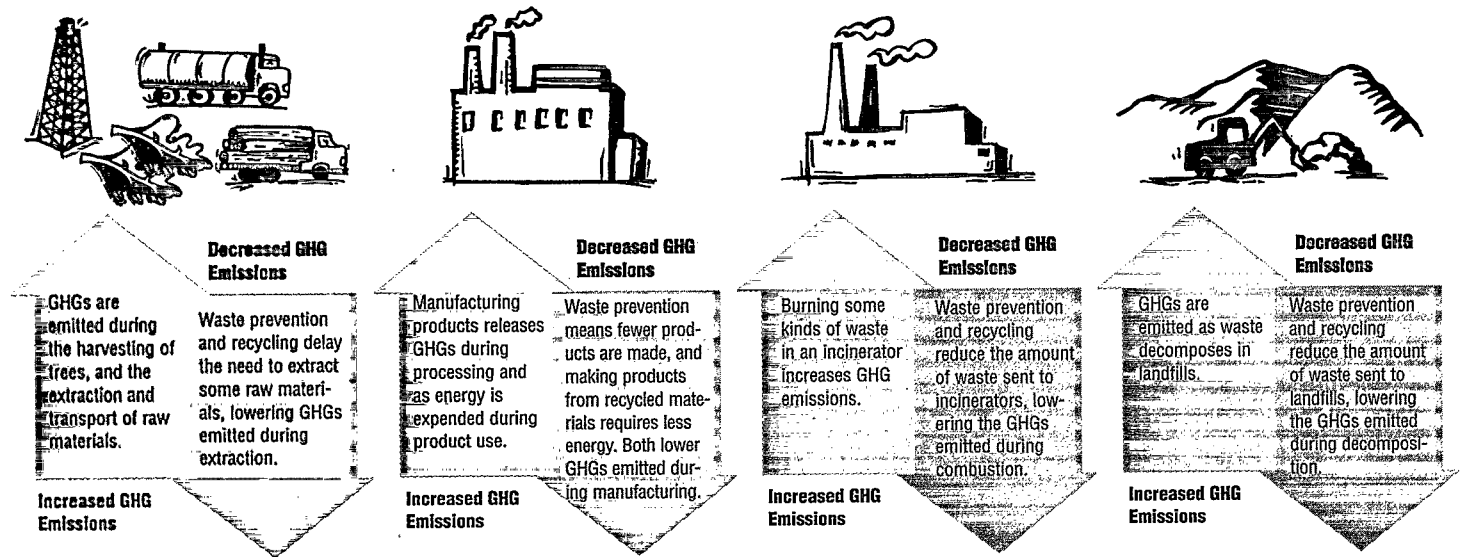
- **Carbon dioxide** is released to the atmosphere when solid waste, fossil fuels (oil, natural gas, and coal), wood, or wood products are burned.
- **Methane** is emitted during the production and transport of coal, natural gas, and oil; the decomposition of organic wastes in municipal solid waste landfills; and the raising of livestock.
- **Nitrous oxide** is emitted during agricultural and industrial activities, as well as during the combustion of solid waste and fossil fuels.

GHGs that are not naturally occurring include byproducts of foam production, refrigeration, and air-conditioning that are called **chlorofluorocarbons** (CFCs), as well as **hydrofluorocarbons** (HFCs) and **perfluorocarbons** (PFCs) generated by industrial processes.

Each GHG differs in its ability to trap heat in the atmosphere. HFCs and PFCs are the most heat-absorbent. Methane traps more than 21 times more heat than carbon dioxide, and nitrous oxide absorbs 310 times more heat than carbon dioxide.



The Link Between Waste Management and Greenhouse Gases



The Link

(Continued from page 1)

Waste reduction efforts can achieve the following:

- **Reduce emissions from energy consumption.** Manufacturing goods from recycled materials typically requires less energy than producing goods from virgin materials. Waste prevention is even more effective. When people reuse things or when products are made with less material, less energy is needed to extract, transport, and process raw materials and to manufacture products. When energy demand decreases, fewer fossil fuels are burned, and less carbon dioxide is emitted to the atmosphere.
- **Reduce emissions from incinerators.** Recycling and waste prevention allow some materials to be diverted from incinerators, thus reducing greenhouse gas emissions from the combustion of fossil fuel-derived waste.
- **Reduce methane emissions from landfills.** Waste prevention and recycling (including

composting) divert organic wastes from landfills, reducing the methane released when these materials decompose.

- **Increase storage of carbon in trees.** Trees absorb carbon dioxide from the atmosphere and store it in wood in a process called "carbon sequestration." Waste prevention and recycling of paper products allow more

trees to remain standing in the forest, where they can continue to remove carbon dioxide from the atmosphere.

What Is the Greenhouse Effect?

The atmosphere that surrounds the Earth contains many types of gases, including GHGs. They regulate the Earth's climate by

What Do Greenhouse Gases Do?



1. The Earth's atmosphere contains greenhouse gases that hold the sun's warmth. In this way, greenhouse gases help control global temperatures.



2. Certain human activities release additional greenhouse gases, upsetting the natural atmospheric balance. Increasing the concentration of greenhouse gases raises global temperatures.

The Balance Sheet: Measuring the Climate Change Benefits of Waste Reduction

To help measure the climate change benefits of waste reduction, EPA recently conducted a comprehensive study of GHG emissions and waste management. The research enables waste managers to analyze their potential to reduce GHG emissions based on the characteristics of their community's waste stream and the management options available to them.

The study estimated the GHG emissions associated with managing 10 types of waste materials: office paper, newspaper, corrugated cardboard, aluminum, steel, plastics (HDPE, LDPE, and PET), food scraps, and yard trimmings. Management options analyzed in the study included waste prevention, recycling, composting, incineration, and landfilling. The research indicates that, in terms of climate benefits, waste prevention is generally the best management option, while recycling is the next best approach.

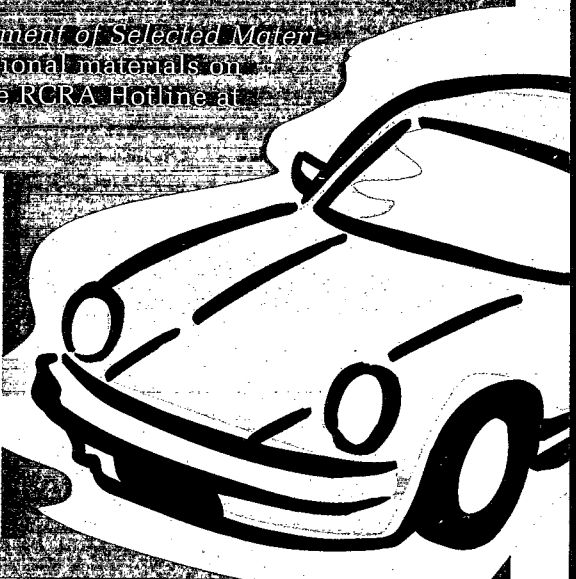
Waste prevention can make an important difference in reducing emissions. By cutting the amount of waste the United States generates back to 1990 levels, EPA estimates we could reduce GHG emissions by 11.6 million metric tons of carbon equivalent (MTCE), the basic unit of measure for GHGs that weights each gas according to its global warming potential. EPA estimates that increasing our national recycling rate from its current level of 28 percent to 35 percent would reduce GHG emissions by another 9.8 million MTCE, compared with landfilling that same material. Together, these levels of waste prevention and recycling would slash GHG emissions by more than 21.4 million MTCE—an amount equal to the average annual emissions from the electricity consumption of roughly 11 million households.

For an online copy of EPA's *Greenhouse Gas Emissions from Management of Selected Materials in Municipal Solid Waste* (EPA-530-R-98-013) and additional educational materials on climate change and waste, visit www.epa.gov/mswclimate or call the RCRA Hotline at 800-424-9346.

Estimated Reductions in GHG Emissions Resulting From Recycling¹

1990	(baseline) 20 million tons of carbon (equivalent to amount emitted by 15 million cars)
1996	33 million tons of carbon (equivalent to amount emitted by 25 million cars)
2005	48 million tons of carbon (equivalent to amount emitted by 36 million cars)

Source: *Recycling...For the Future—Consider the Benefits*, November 1998.



holding warmth in an atmospheric blanket around the planet's surface. Scientists call this phenomenon the "greenhouse effect." Without GHGs, the average temperature on Earth would be 5 degrees Fahrenheit instead of the current 60 degrees Fahrenheit. Excess GHGs in the atmosphere, however, can raise global temperatures.

The Consequences of Climate Change

What's so bad about warm days and balmy nights? Unfortunately, increased concentrations of GHGs in the atmosphere will not create a worldwide tropical paradise. Even if it did, the Earth's diverse ecosystems depend on a variety of climates. Human activities that thicken the gaseous "greenhouse"

around the planet threaten to disrupt the diversity of habitats and the life dependent on them.

In the past 100 years, scientists have detected an increase of 1 degree Fahrenheit in the Earth's average surface temperature. The international scientific community is increasingly in agreement

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¹ Emission reductions estimated for waste reduction activities within any given year occur over a multiyear timeframe.

A Conversation With David Gardiner

David Gardiner is executive director of the White House Climate Change Task Force. President Clinton established the task force in 1997 to engage the public in the climate change issue and coordinate Administration climate change policy. Before joining the task force, Gardiner was EPA's assistant administrator for policy for 6 years. *Reusable News* recently caught up with Gardiner to discuss climate change and the activities of the task force.

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RN: How pressing is the global climate change problem?

DG: It's the greatest environmental challenge of the 21st century and one we can't afford to be wrong on. If we fail to address climate change, it could overwhelm all our work in addressing other environmental challenges. To put it in perspective for you, the difference in temperature from the last ice age to now is about 9 degrees Fahrenheit. The Intergovernmental Panel on Climate Change (IPCC) concluded that the Earth has already warmed about 1 degree Fahrenheit over the last century, and the group estimates that the global surface air temperature will increase an additional 2 to 6.5 degrees Fahrenheit in the next 100 years. Warming of this magnitude will impact human health, fresh water supplies, forests and other natural areas, and agricultural productivity. There is a genuine need to focus on actions to reduce our greenhouse gas emissions and minimize the adverse impacts of a changing climate.

RN: What role do humans play in climate change?

DG: The IPCC recently announced that scientific evidence suggests human activities are contributing to climate change. From the fuels we burn to the forests we cut down to the trash we throw out, human activity affects the climate of the Earth. As our emissions continue to grow, the planet will continue to warm.



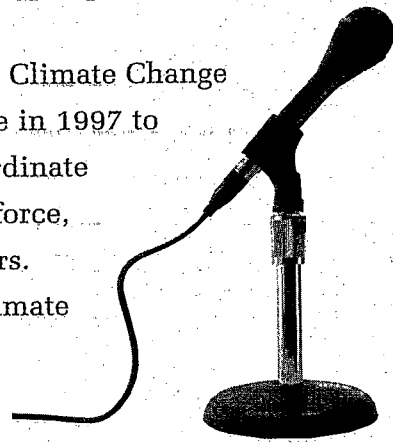
RN: How do waste production and management factor into climate change?

DG: Greenhouse gas emissions come from a variety of sources, including the production and

management of waste. Landfills produce methane, and waste transportation and incineration create carbon dioxide. Therefore, if we prevent or reduce waste, we reduce greenhouse gas emissions. Reducing waste is something everyone can do to reduce the rate of emissions of greenhouse gases. In addition, 85 percent of greenhouse gas emissions in the United States come from energy use, and using recycled goods in manufacturing can save energy.

RN: How will addressing global climate change impact the economy?

DG: Protecting the environment does not mean hurting the economy. In fact, there are many examples of environmental initiatives producing economic success as well, such as EPA's Jobs Through Recycling Program <www.epa.gov/jtr>. Government, however, needs to work with industry in encouraging the reduction of greenhouse gases. The President's Climate Change Technology Initiative, for example, is a package of investments and targeted tax incentives to put us on a clean energy path and



Reducing GHGs at the Source

improve energy efficiency, saving money for consumers and businesses. President Clinton speaks often of our need to abandon the big idea of the Industrial Age—that more economic growth means more pollution. In today's high tech economy, that simply isn't true. With today's energy technologies, developing countries can avoid the mistakes we've made and choose a clean energy future.

RN: What can the average citizen do to help reduce greenhouse gas emissions?

DG: Besides reducing emissions from fossil fuels through energy and transportation efficiency, we also can help minimize climate impacts through source reduction, reuse, and recycling. This saves energy, which translates directly to reduced greenhouse gas emissions. We should all do our share to protect the Earth and its atmosphere. ☐

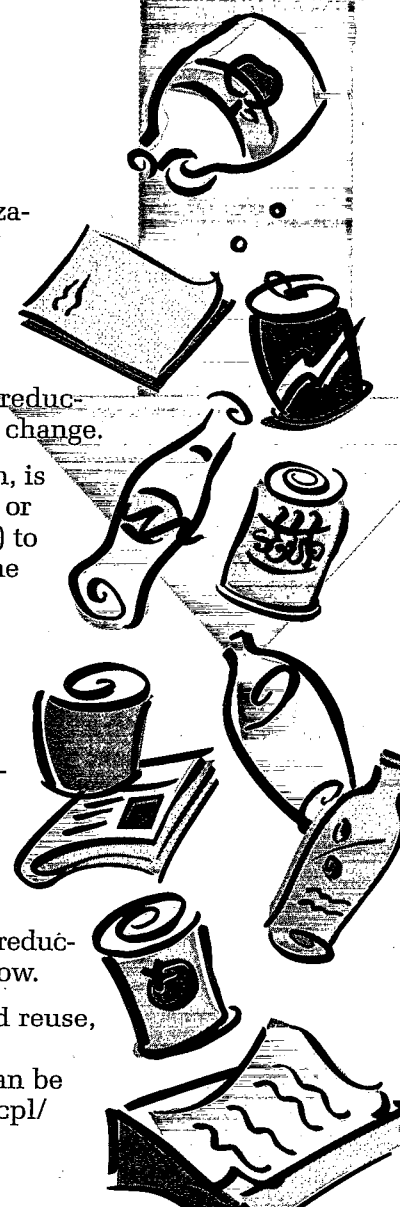
Reducing the amount of paper your organization uses or transporting material in a reusable container is not just being cost-effective—it is taking concrete steps to fight global warming. More so than any other waste management option—including composting, recycling, landfilling, and incineration—source reduction helps turn back the clock on global climate change.

Source reduction, often called waste prevention, is any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they become municipal solid waste. Source reduction also includes the reuse of products or materials.

When a material is source reduced (i.e., less of the material is made), the GHG emissions associated with making the material and managing the postconsumer waste are avoided. In addition, when paper products are source reduced, trees that would otherwise be harvested are left standing and continue to grow, removing additional carbon dioxide from the atmosphere.

GHG emission reductions resulting from source reduction of a variety of common materials are listed below.

For more information on source reduction and reuse, visit www.epa.gov/epaoswer/non-hw/muncpl/sourcred.htm. Source reduction publications can be found at www.epa.gov/epaoswer/non-hw/muncpl/sourcpub.htm. ☐



GHG Emission Reductions for Source Reduction (Metric Tons of Carbon Equivalent Per Ton of Material Source Reduced)

Material	Emission Reductions
Aluminum Cans	2.98
Office Paper	1.03
PET Plastic	0.98
Newspaper	0.91
LDPE Plastic	0.89
Steel Cans	0.84
Corrugated Cardboard	0.78
HDPE Plastic	0.61
Glass	0.14

Source: U.S. EPA. *Greenhouse Gas Emissions From Management of Selected Materials in Municipal Solid Waste*. September 1998.



LMOP Energizes Landfill Methane Programs

Did you know that approximately 50 percent of the gas emitted from landfills is methane, a potent greenhouse gas (GHG)? Rather than allowing this gas to escape to the atmosphere and contribute to global climate change, however, hundreds of landfills are learning how to harness this gas into useful energy, through EPA's Landfill Methane Outreach Program (LMOP).

either flare the gas or install an LFGTE system. LFGTE offers communities and landfill owners an opportunity to reduce the costs of compliance by providing a source of renewable energy for sale. LFGTE users also help prevent the emission of other GHGs such as carbon dioxide, since using landfill gas for energy offsets the need to burn other—more polluting—fuels.

Currently, more than 300 LFGTE projects are operating in the country, while another 60 are under construction and approximately 100 are exploring development opportunities. Thus far, these projects have prevented the release of 2 million metric tons of carbon equivalent into the atmosphere, or the GHG reduction equivalent of removing 1.6 million cars from the road.

To date, LMOP has assisted in the development of more than 140 operational LFGTE projects. Local partners such as the Blue Ridge Resource Conservation and Development (RC&D) Council in North Carolina have benefitted from LMOP's involvement, which helped the group and its partners launch an LFGTE project in 1999 that will power a greenhouse and crafts studio for the disabled at the Yancey-Mitchell Landfill. "We really appreciate LMOP's support," said Terry Woodruff of Blue Ridge RC&D. "It helped us raise the money needed for this project."

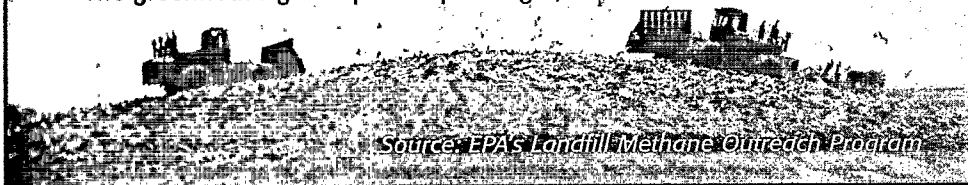
LMOP currently has more than 240 allies and partners that have signed voluntary agreements to work with EPA to develop cost-effective LFGTE projects. To encourage more landfills to recover their methane for energy, LMOP has developed a series of candidate profiles for more than 1,300 landfills in 31 states. For more information about LMOP or LFGTE, visit www.epa.gov/lmop.

Calculating the Benefits

To determine the energy and climate change benefits of an LFGTE project, use the following:

1 million tons of waste in place equals:

- 300 cubic feet of landfill gas per minute
- 7 million kilowatt hours of energy per year
- Enough energy to power 700 homes for a year
- Removing 6,100 cars from the road for a year
- The greenhouse gas impact of planting 8,300 acres of trees



Source: EPA's Landfill Methane Outreach Program

Created as part of President Clinton's Climate Change Action Plan, LMOP is a voluntary partnership program that encourages the development of environmentally and economically sound landfill gas-to-energy (LFGTE) projects across the United States. LMOP helps build partnerships among state agencies, industry, energy service providers, local communities, and other stakeholders to realize the benefits of landfill gas recovery and promote a sustainable future.

Under the Clean Air Act, EPA currently requires many landfills to collect and combust landfill gas; to comply, these facilities can



Run for Cover: Compost Could Cut Landfill Greenhouse Gas Emissions

Various technologies have been developed to reduce greenhouse gas (GHG) emissions from landfills. Nature, however, may hold a simpler answer. Scientists and engineers have started to explore how covering landfills with layers of compost—formed when organic matter breaks down under the proper conditions—can cost-effectively reduce landfill gas emissions. This research holds promise for future landfill management.

According to researchers at the University of Agricultural Sciences in Vienna, Austria, even landfills with advanced systems in place to capture and combust the methane gas (usually to produce energy) can leave behind more than 40 percent of the gas to rise into the atmosphere. In addition, all the landfills in the United States that have collection systems only recover approximately 14 percent of total U.S. landfill gas emissions annually.

To further reduce these emissions, some landfill operators are looking to harness the biochemical processes found within compost. Used in combination with collection systems, covering landfills with compost holds a promising future in reducing landfill GHG emissions throughout the country.

The Composting Process

Organic waste is teeming with microbes that continually feed and thrive on the organic matter. Under the right conditions—which include the proper amounts of oxygen and moisture, and the right mix of different types of organic wastes (e.g., grass, wood chips, food, sewage sludge, etc.)—the pile heats up, indicating that aerobic microbes are hard at work. These microbes require oxygen to break down the matter into food, carbon dioxide, and water. When oxygen isn't circulating properly through the composting pile, anaerobic microbes take over the process, breaking down the matter into carbon dioxide and methane, which results in a pungent odor.

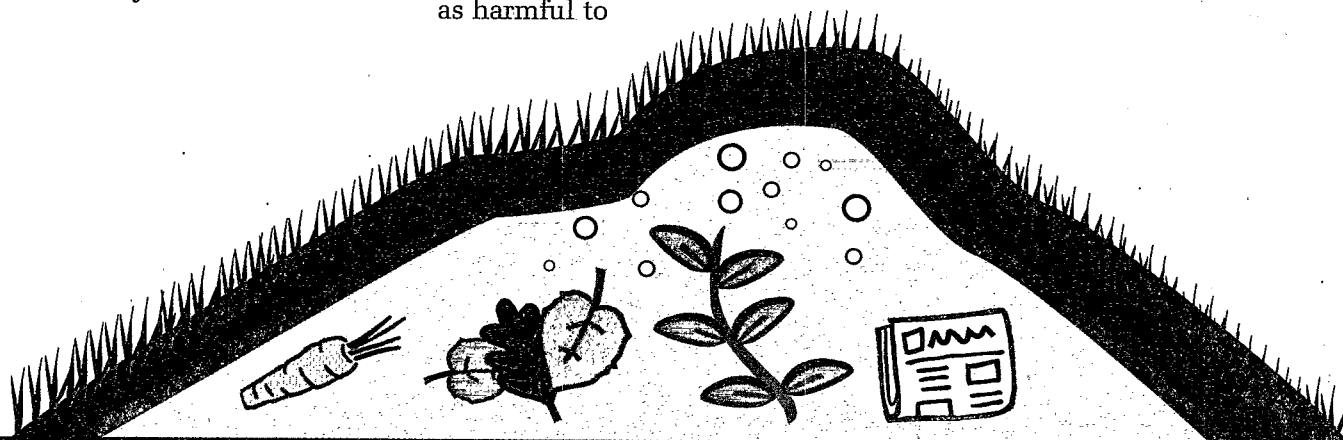
Harnessing Nature's Capabilities

While aerobic decomposition can occur in landfills due to trapped oxygen, once the aerobic microbes deplete the oxygen, anaerobic microbes take over, producing methane. As the methane emanates from the depths of the landfill, it migrates through the layers of compost cover. The aerobic microbes within the compost capture the methane and convert it into food, emitting only carbon dioxide, water, and other substances which are not as harmful to

the atmosphere. Scientists currently are testing how the process performs depending on the variety of compost used (e.g., sewage sludge, municipal solid waste, etc.), climactic and seasonal variations, and the shape and structure of the compost layer.

While U.S. regulations do not currently allow the use of compost alone as a final cover yet, compost has already proven useful in other environmental applications. Composting alone helps reduce the generation and emission of GHGs by diverting organic materials from landfills in the first place. As a landfill cap, it could serve a second purpose of rendering escaping methane from landfills less harmful. Taking advantage of the same biochemical process described above, compost also can help remediate soils contaminated by metals and explosives and filter runoff from roadways.

For more information on the innovative uses of compost, visit www.epa.gov/compost. For more information on composting, see EPA's *WasteWise Update* "Recovering Organic Wastes—Giving Back to Mother Nature" at www.epa.gov/wastewise/pub_c.htm.



Getting WARM: An Easy Way to Calc

If you are calculating the climate change impacts of your office or community waste reduction programs, EPA's Waste Reduction Model (WARM) can help. WARM does not just calculate greenhouse gas (GHG) reductions for paper and aluminum; it offers conversions for more than a dozen waste commodities in waste prevention, recycling, and composting.

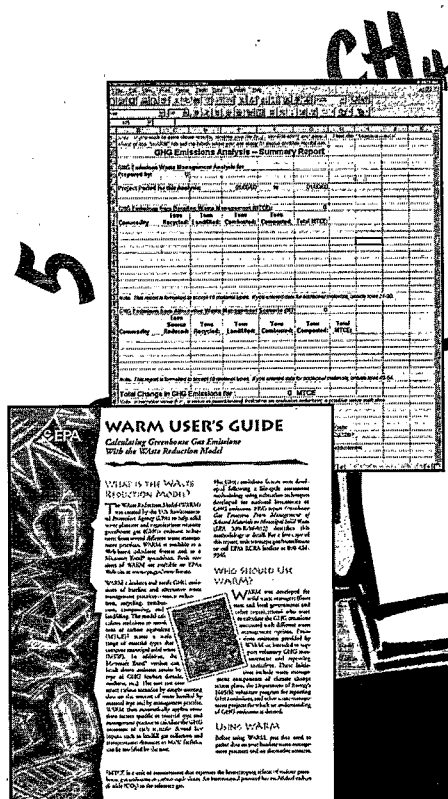
WARM was developed using research performed for the EPA report *Greenhouse Gas Emissions From Management of Selected Materials in Municipal Solid Waste*. The report examines the relationship between specific GHGs, including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and perfluorocarbons (CF₄ and C₂F₆), and the major components of the municipal solid waste stream, including newspaper, office paper, corrugated cardboard, aluminum, steel cans, plastics, food scraps, and yard trimmings. EPA created WARM to help solid waste planners and organizations track and

voluntarily report GHG emissions reductions from several different waste management practices.

Originally designed as an easy-to-use Microsoft Excel spreadsheet, WARM allows users to merely identify the volume of materials prevented, recycled, and/or composted and plug the numbers (in tons) into the spreadsheets. WARM converts the information and provides both a detailed breakdown of gases reduced and a summary sheet of overall GHG reductions in metric tons of carbon equivalent (MTCE).

Now, in addition to the downloadable Excel version, EPA offers an online WARM application that does not require use of Microsoft Excel. The online version of WARM can be found at <www.epa.gov/globalwarming/actions/waste/warm.htm>, and the Excel version can be downloaded from <www.epa.gov/globalwarming/actions/waste/software.html>. New users are encouraged to review the concise and helpful *WARM Users Guide*, which can be downloaded from

<www.epa.gov/globalwarming/actions/waste/tools/warm.pdf>.



In 1993, the United States established a national climate change action plan (CCAP) that calls for cost-effective actions and voluntary cooperation among states, local governments, industries, and citizens to reduce greenhouse gas (GHG) emissions. In response, several states and a few local governments have adopted, or are developing, CCAPs. Like the national CCAP, state CCAPs identify initiatives to reduce GHG emissions by increasing utilization of renewable

energy sources, energy efficiency, reforestation, and waste diversion.

As demonstrated by other articles in this issue, solid waste diversion helps reduce emissions of GHGs, particularly generation of methane in landfills. Using methodologies developed by EPA, including the Waste Reduction Model (WARM), the states of Iowa, Delaware, and Missouri have determined how solid waste diversion activities such as source reduction and recycling will help them achieve the goals set forth in their CCAPs.

Iowa completed its CCAP in 1996, and was one of the first states to do so. As

a precursor to the CCAP, Iowa developed an inventory of state GHG emissions for 1990, which identified landfills as the second largest source of methane emissions in the state. Local solid waste agencies annually submit reports that provide the total tons of waste disposed of in landfills or diverted through source reduction and recycling. Using these local reports and making a few simplifying assumptions, Iowa developed an estimate value of their source reduction and recycling efforts in 1995. For the purposes of the WARM calculations, the baseline scenario assumed that all waste generated was disposed of in

² Tellus Institute. *Incorporating Waste Diversion Impacts in Climate Change Action Plans*. December 15, 1999.

ate Climate Impacts

So far, WARM's list of users has ranged from state and local governments, universities, and public utilities to *Fortune* 1000 companies. EPA's WasteWise Program (visit www.epa.gov/wastewise) has adopted WARM as its primary mode of converting its partners' results to climate change benefits. WasteWise part-

ners submitting an annual report to the program automatically receive a WARM report from EPA detailing the effect their efforts in waste prevention and recycling are having on GHG emission reductions. For example:

- **The Seydel Company**, a chemical manufacturer from the Southeast, has worked hard to reduce waste and recycle. A total of 286 MTCE of GHG reductions will be achieved through wood, plastic, metals, and corrugated cardboard recycling, and waste prevention of more than 200 tons of HDPE and PET plastics and 300 tons of organic wastes.
- **Public Service Enterprise Group**, a New Jersey electric and gas utility, found that its efforts to recycle corrugated cardboard, mixed paper, various metal commodities, and organic wastes and to reuse metals and plastics will have a net benefit of 146,750 MTCE.
- In 1999, **McDonald's Corporation** also found sizeable GHG reductions through prevention

Metric Tons of Carbon Equivalent (MTCE) Conversions

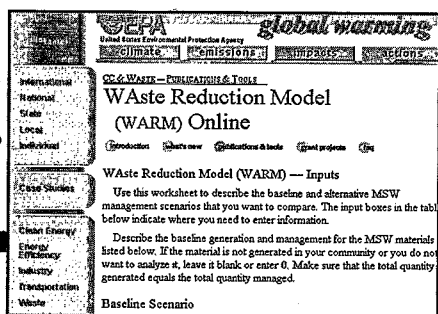
1 million MTCE equals:

- The emissions of 750,000 cars, each traveling 11,000 miles at 20 miles per gallon.
- The annual emissions from the electric power consumption of roughly 600,000 households.
- The added carbon storage of 1 million acres of a well established, rapidly growing stand of mixed species trees.

of boxboard packaging and recycling collection of more than 1.6 million tons, including corrugated cardboard and food waste. It will result in the reduction of 1.2 million MTCE.

Other businesses and organizations may find it interesting to try calculating their own waste reduction and recycling volumes to see

(Continued on page 10)



landfills. The alternative waste management scenario accounted for the source reduction and recycling volumes reported for 1995. The source reduction and recycling activities undertaken by Iowa in 1995 are estimated to result in GHG reductions of roughly 430,000 MTCE.

Delaware's CCAP sets a GHG emission reduction target of 7 percent by 2010, based on the 1990 baseline. The University of Delaware just completed a case study that documents how the WARM model was used to develop Delaware's CCAP goals. In addition, the state Office of Economic Develop-

ment recently developed a manual for solid waste professionals, *Local Waste Reduction Efforts Can Turn Down the Heat on Global Warming*, that discusses the relationship between waste reduction activities and GHG reductions. The manual also provides information on how to use the WARM model and the benefits of its use.

Missouri is in the process of finalizing its CCAP. The state had data on the tonnage and composition of solid waste disposed, but no data on the tonnage and composition of solid waste diverted. Since diversion data is needed to run WARM, the state com-

bined the existing state disposal totals in conjunction with national source reduction, recycling, and composting data from the *Characterization of Municipal Waste in the United States: 1997 Update*, to estimate the WARM inputs for 1997. Based on these estimated volumes of diversion, Missouri is reducing GHG emissions by more than 1 million MTCE, a number the state can use to set future CCAP goals.

For more information on state actions to reduce GHG emissions and to learn whether your state has developed a CCAP, go to <http://yosemite.epa.gov/globalwarming/ghg.nsf/actions/state>.

Fields of Green

State and local governments are not the only ones taking actions to reduce greenhouse gas (GHG) emissions through waste management. Through increased source reduction activities, recycling, and composting, the private sector is also taking steps to positively impact climate change.

The Center for Ecological Technology (CET), for example, is partnering with several organizations in the Boston area to reduce GHG emissions through increased private sector composting and other organic materials management strategies. The project will concentrate on assisting food waste processors in expanding their composting capacities. To date, the project has helped divert approximately 22,000 tons of organic materials, which reduces GHG emissions by approximately 5,700 MTCE.

CET is acting as a facilitator, providing technical and regulatory support. The project partners began by conducting a survey of existing and potential food waste processors to assess their current composting capacity, potential for expansion, and possible expan-



The Seattle Mariners are reducing GHG emissions by increasing recycling activities at their new Safeco Field Stadium.

sion barriers. CET and the project partners have organized focus group meetings with the regulatory community, hauling companies, and food industries to develop future plans to help food waste processors more effectively manage their organic wastes. For more information on CET, visit www.cetonline.org/AboutCET/about_cet.htm.

On the other side of the country, the Seattle Mariners are "greening" their new **Safeco Field** stadium, and through increased recycling, preventing 33.5 tons of carbon dioxide from entering the atmosphere. The Business and Industry Recycling Venture (BIRV) of the Greater Seattle Chamber of Commerce and several area non-

profit organizations pursued funding on behalf of the Mariners to pay for a temporary recycling coordinator to help organize and initiate a comprehensive recycling and waste reduction program. Started in May 1999, the program includes the following waste management efforts:

- Public area recycling.
- Recycled-content office products.
- A color-coded recycling collection system.
- Packaging considerations.
- Education for stadium staff and the public.

By the end of the 1999 baseball season, the stadium had collected 22.31 tons of recyclables. BIRV estimates that this accounted for approximately 44 percent of the cardboard, tin, aluminum, glass, and PET plastic generated at the stadium that season. With continued efforts, the Seattle Mariners expect to save approximately \$53,000 in waste disposal over the next 10 years. The project will serve as a catalyst to ensure that solid waste management is included as a key consideration in the city of Seattle's climate change mitigation planning efforts. ■

Getting WARM

(Continued from page 9)

how their efforts may reduce GHG emissions. To determine how much of an impact increased recycling rates have on GHG reductions, simply determine how many tons of material you would divert at a certain recycling percentage (e.g., increase from 10 to 15 percent), and input those num-

bers into WARM. Gradually increase the recycling rate to see how the related emission reductions change.

For more information on WARM, visit www.epa.gov/mswclimate, or contact Henry Ferland at EPA's Municipal and Industrial Solid Waste Division at 703 308-8254 or ferland.henry@epa.gov. ■

RESOURCES

PUBLICATIONS

Climate Change and Waste Folder

Climate Change and Waste: Reducing Waste Can Make a Difference (EPA530-E-99-002) provides a comprehensive look at the link between

municipal solid waste and climate change. The folder covers the greenhouse gas (GHG) effect, the consequences of climate change, and the work EPA is doing to help reduce the effects of climate change. In addition, the folder contains two 1-page fact sheets on EPA solid waste programs designed to help reduce GHG emissions. *Pay-As-You-Throw: A Cooling Effect on Climate Change* (EPA530-E-99-002a) describes how PAYT programs provide an economic incentive to reduce waste, thereby helping reduce GHG emissions. Similarly, *WasteWise: Climate Benefits From Reducing Waste* (EPA-530-E-99-002b), discusses the climate change benefits that occur through the waste reduction activities the WasteWise program encourages in organizations and industries. To obtain a copy of the folder and/or the PAYT and WasteWise fact sheets, call the RCRA Hotline at 800 424-9346.

Report Covers the Issues

EPA's *Greenhouse Gas Emissions From Management of Selected Materials in Municipal Solid Waste* (EPA-530-R-98-013) provides data that can be used to support voluntary reporting of emission reductions from waste management practices. The report analyzes the impact of municipal solid waste on

GHG emissions and reductions achievable through source reduction and recycling. To order a copy of this report, call the RCRA Hotline at 800 424-9346.

WEB SITES

EPA's Climate Change and Waste

<www.epa.gov/mswclimate>

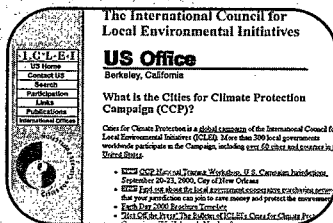
EPA's climate change and waste Web site was recently redesigned and integrated within the EPA global warming site to improve usability and provide more comprehensive information on climate change. In addition to a detailed discussion on the link between climate change and waste, the site includes publications, grant project descriptions, and a list of frequently asked questions.

ICLEI's Cities for Climate Protection Campaign

<www.iclei.org/us/US_ccp.html>

The International Council for Local Environmental Initiatives (ICLEI) is an association of local governments dedicated to using local action to prevent and solve local, regional, and global environmental problems. More than 300 local governments worldwide participate in ICLEI's Cities for Climate Protection (CCP) Campaign, including more

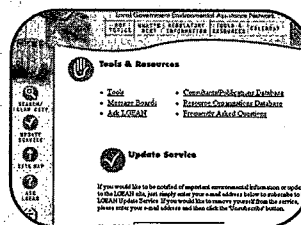
than 60 cities and counties in the United States.



LGEAN's Local Climate Change Network

<www.lgean.org/html/hottopics2.cfm>

Managed by the International City/County Management Association, the Local Government Environmental Assistance Network (LGEAN) Web site provides a summary of the climate change issue and a description of the Local Climate Change Network it is initiating. The purpose of the network is to raise awareness of climate change and assist local governments and communities in mitigating the factors that cause climate change.

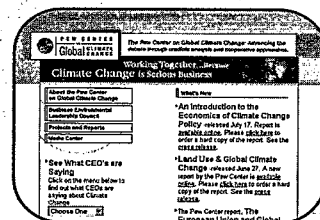


Pew Center's Business Environmental Leadership Council

<www.pewclimate.org>

Twenty-one major companies, with most included in the *Fortune* 500, are working together

through the Pew Center on Global Climate Change to educate the public on the risks, challenges, and solutions to climate change. These efforts are spearheaded by the Center's Business Environmental Leadership Council, a group of leading companies worldwide that are responding to the challenges posed by climate change.



This issue of *Reusable News* is also available on the Internet. Access this and other EPA publications at <www.epa.gov/epaoswer/non-hw/recycle/reuse.htm>.

The Link

(Continued from page 3)

that human activity is responsible for some of this increase. A rise of only a few degrees in the Earth's average temperature could result in:

- More frequent and intense storms.
- Flooding of beaches, marshes, and other low-lying coastal areas.
- More precipitation in some areas and not enough in others.
- Wider distribution of certain infectious diseases.

Such significant changes could damage communities and national economies, as well as alter the natural world. Of course, many uncertainties remain. No one can predict the precise timing, magnitude, and regional patterns of climate change. Nor can anyone foretell the ability of mankind and nature to adapt to such changes. It is clear, however, that climate change will not be easily reversed. Because GHGs remain in the atmosphere a long time, turning back climate change may take decades or even centuries.

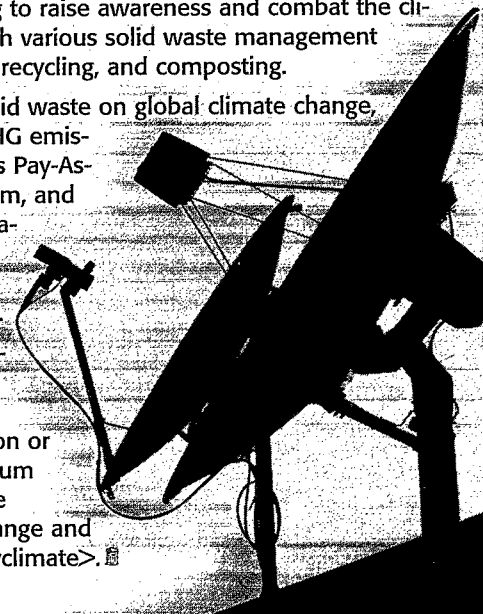
Let's Broadcast the Climate Change Benefits of Waste Management

On December 7, 2000, from 1 to 3 p.m., e.s.t., EPA's Climate and Waste Program, in partnership with several national solid waste and governmental organizations, will broadcast a nationwide satellite forum entitled *Why "Waste" a Cool Planet: MSW Solutions for Global Climate Change*. This free, interactive program is designed to help educate businesses and state and local governments about the relationship between solid waste management and climate change. This forum will feature:

- Nationally recognized climate change experts exploring the global warming impacts from solid waste management activities.
- Businesses undertaking waste reduction activities to reduce greenhouse gas (GHG) emissions throughout a product's life cycle, from design and development through manufacturing and product end-of-life management.
- State and local governments helping to raise awareness and combat the climate change impacts associated with various solid waste management options, including source reduction, recycling, and composting.

Panelists will discuss the impacts of solid waste on global climate change, highlighting how they have reduced GHG emissions through various programs such as Pay-As-You-Throw and EPA's WasteWise Program, and explaining ways to measure GHG mitigation from waste reduction activities. Viewers will have the opportunity to call in during the forum with questions.

If you are interested in hosting a downlink site, please send an e-mail to the Climate and Waste Program at <ccwsf@epa.gov>. For more information or to download a copy of the Satellite Forum Coordinator's Kit and the Downlink Site Registration Form, visit the Climate Change and Waste Web site at <www.epa.gov/mswclimate>.



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